

# LESSON 1

## CSI: Foodborne Illness

Student Learning Objectives:	National Health Education Standards:
1. Identify the causes of foodborne illness.	• Core Concepts
2. Analyze personal food handling practices to prevent foodborne illnesses.	• Self Management

### Lesson Synopsis

Invite students to help solve mysteries involving death and illness due to foodborne illness. Describe helpful and harmful bacteria and ways bacteria can contaminate food. Explain four rules for preventing foodborne illness. Categorize ways food can be contaminated by bacteria. Form crime scene investigation teams to examine situations leading to foodborne illness and identify what could have been done to prevent it. Personalize and share ideas for ways to prevent foodborne illness.



Activity	Time in Minutes	Materials Needed
Introduction	1	Supplied by the Teacher <ul style="list-style-type: none"> <li>• Video clip of a popular television crime investigation program (Suggestion)</li> <li>• AV equipment (Suggestion)</li> </ul>
Teacher Input	16	Health Education Materials <ul style="list-style-type: none"> <li>• Foodborne Illness Cards: "Causes of Foodborne Illness," Michigan Model for Health Clearinghouse</li> </ul> Teacher Manual Resources <ul style="list-style-type: none"> <li>• Slide Master: "Helpful Bacteria"</li> <li>• Slide Master: "Harmful Bacteria – Part One"</li> <li>• Slide Master: "Harmful Bacteria – Part Two"</li> <li>• Slide Master: "Cook"</li> <li>• Slide Master: "Clean"</li> <li>• Slide Master: "Separate"</li> <li>• Slide Master: "Chill"</li> <li>• Teacher Reference: "Bacteria and Foodborne Illness Questions and Answers"</li> </ul> Supplied by the Teacher <ul style="list-style-type: none"> <li>• Projector</li> <li>• Slides</li> <li>• Computer with Internet access (Suggestion, Extension Activity)</li> <li>• Computer lab with Internet access (Extension Activity)</li> </ul>
Application or Skill Practice	25	Health Education Materials <ul style="list-style-type: none"> <li>• Foodborne Illness Cards: "Causes of Foodborne Illness," Michigan Model for Health Clearinghouse</li> <li>• Poster Set: "Food Safety Rules," Michigan Model for Health Clearinghouse</li> </ul>

<b>Application or Skill Practice (continued)</b>		<p>Teacher Manual Resources</p> <ul style="list-style-type: none"> <li>• Teacher Key: "Foodborne Illness Card Categories"</li> <li>• Teacher Master: "CSI: Foodborne Illness Mysteries"</li> <li>• Teacher Key: "CSI: Foodborne Illness Mysteries"</li> <li>• Teacher Reference—Assessment: "Assessment Rubric for Skill Development: CSI Foodborne Illness Mysteries"</li> <li>• Student Self-Assessment Rubric: "CSI Foodborne Illness Mysteries"</li> </ul> <p>Supplied by the Teacher</p> <ul style="list-style-type: none"> <li>• Pens and pencils</li> <li>• Tape</li> <li>• Computer lab with Internet access (Extension Activity)</li> </ul>
<b>Closure</b>	3	<p>Health Education Materials</p> <ul style="list-style-type: none"> <li>• Poster: "Keep G-E-R-M-S Away," Michigan Model for Health Clearinghouse</li> </ul> <p>Teacher Manual Resources</p> <ul style="list-style-type: none"> <li>• Family Resource Sheet: "Keeping Your Family Safe From Foodborne Illness"</li> </ul> <p>Supplied by the Teacher</p> <ul style="list-style-type: none"> <li>• Computer lab with Internet access (Suggestion)</li> </ul>
<b>TOTAL</b>	<b>45</b>	

## Preparation

Prior to the Lesson:

- **Decide if you want to assess** student skill development. A rubric is provided for you to use at the end of this lesson, "Assessment Rubric for Skill Development: CSI Foodborne Illness Mysteries."
- **Decide if you want students to assess** their own progress. **Duplicate** the rubric, "CSI Foodborne Illness Mysteries," for students if you plan to have them use it.

For Teacher Input:

- **Prepare** slides from the slide masters, "Helpful Bacteria," "Harmful Bacteria – Part One," "Harmful Bacteria – Part Two," "Cook," "Clean," "Separate," and "Chill."
- **Review** the teacher reference, "Bacteria and Foodborne Illness Questions and Answers."

For Application or Skill Practice:

- **Display the poster set**, "Food Safety Rules." Place one poster on the wall in each corner of the room.
- **Decide** if you want to form four or eight small groups for the crime scene investigation teams.
- **Duplicate** the teacher master, "CSI: Foodborne Illness Mysteries," and **cut apart** the mysteries so that each small group will have one.
- **Review** the teacher keys.


For Closure:

- **Duplicate** the family resource sheet, "Keeping Your Family Safe From Foodborne Illness," for students to take home.
- **Display** the poster, "Keep G-E-R-M-S Away."

## LESSON PROCEDURE







**Introduction:** Invite students to help solve a mystery.

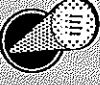





**Approximately 1 minute**


Instructional Steps	Script & Detailed Directions	Extensions & Suggestions
<p>Introduce the concept of solving a mystery.</p>	<p><i>If you enjoy solving mysteries, point to your brain.</i></p> <p><i>Well, today, you are going to form CSI teams. Who can tell me what CSI stands for?</i></p> <p>Answer: crime scene investigators</p> <p><i>You are going to investigate a culprit that kills 5,000 Americans each year. That equals about one death every 13 minutes. Another 76 million people get ill each year. But these deaths and illnesses are preventable.</i></p> <p><i>If you'd like to help stop this culprit, clap your hands.</i></p>	 <p>You may want to introduce this lesson by showing a brief clip of the beginning of an episode of a popular television crime investigation program. Select one that is not graphic.</p>
<p>Introduce the unit. State the focus of the lesson.</p>	<p><i>We are starting a unit on nutrition and physical activity. To begin, we'll investigate ways to avoid food poisoning, or foodborne illness.</i></p>	

**Teacher Input:** Discuss ways food can become contaminated with bacteria and four ways to prevent foodborne illness.

**Approximately 16 minutes**




Instructional Steps	Script & Detailed Directions	Extensions & Suggestions
<p>Assess student knowledge about helpful and harmful bacteria.</p>	<p><i>The first thing a CSI team does is gather all the information they can find about the crime. We know the culprit who commits this crime: bacteria. Now we need to figure out how to stop bacteria from injuring more people.</i></p> <p><b>What are bacteria?</b></p> <p>Answers: Students' responses may vary:</p> <ul style="list-style-type: none"> <li>• microscopic germs</li> <li>• tiny one-celled organisms that can cause disease</li> <li>• some bacteria can be helpful, and others can be harmful</li> </ul>	<p></p> <p>If your students don't know what bacteria are, visit these sites for more information and photos.</p> <ul style="list-style-type: none"> <li>• Microbe World, American Society for Microbiology</li> </ul>
<p>Display the slide master, "Helpful Bacteria." Use the teacher reference, "Bacteria and Foodborne Illness Questions and Answers," for additional information.</p>	<p><i>Although we call bacteria "germs," some bacteria are helpful. They are used to make cheese and yogurt; they help decompose dead animals and plants; they are used to clean up oil spills; they clean sewage in water treatment plants; they make antibiotic medicines; and they help us digest our food.</i></p>	<p></p> <p><a href="http://www.microbeworld.org/microbes/bacteria/">www.microbeworld.org/microbes/bacteria/</a></p> <p></p> <ul style="list-style-type: none"> <li>• National Geographic Kids</li> </ul> <p></p> <p><a href="http://www.nationalgeographic.com/ngkids/0010/bacteria/">www.nationalgeographic.com/ngkids/0010/bacteria/</a></p> <p></p> <ul style="list-style-type: none"> <li>• Biomedica Associates</li> </ul> <p></p> <p><a href="http://ebiomedica.com/gall/bacteria/">http://ebiomedica.com/gall/bacteria/</a></p>




<p>Display the slide master, "Harmful Bacteria – Part One."</p>  <p>Display the slide master, "Harmful Bacteria – Part Two."</p> 	<p>However, other bacteria are harmful, especially if they get into places they don't belong. For example, did you know that bacteria cause your cavities? Of course you know that bacteria can make people sick with conditions like strep throat, pink eye, tuberculosis, pneumonia, and infections of the bladder and kidneys.</p> <p><b>What do you think can happen when harmful bacteria get into food?</b></p> <p>Answer: It can make people sick by causing foodborne illness or food poisoning.</p>	 <p>Have the students do some internet research and nominate their favorite bacteria for the Most Helpful Bacteria Award. They can nominate the most harmful bacteria for the Most Damaging Bacteria Award.</p>
<p>Describe the conditions that allow bacteria to get into food.</p> <p>Distribute a card, "Causes of Foodborne Illness," to each student. Describe situations in which foodborne illness might result.</p>	<p><b>What are some ways you think bacteria might get into food?</b></p> <p>Answers:</p> <ul style="list-style-type: none"> <li>• Touching food with dirty hands</li> <li>• Using dirty utensils or equipment to prepare food</li> <li>• Putting food on dirty dishes or other surfaces</li> <li>• From bacteria in the soil in which plants grow</li> <li>• From animals raised for food</li> </ul> <p><i>Each of you has a card describing some ways bacteria could get into food. One at a time, quickly stand and read the situation on your card.</i></p> <p><b>Nod your head if you have consumed food or water in a similar situation as these. Probably some of you have suffered the terrible stomachache, vomiting, and diarrhea that can result.</b></p>	 <p>If you don't have enough cards for every student, have them work in pairs.</p>
<p>Identify four food safety rules for preventing foodborne illness.</p> <p>Explain each rule as you display the slide masters, "Cook," "Clean," "Separate," and "Chill."</p> 	<p><i>Perhaps all this talk about bacteria growing in food has ruined your appetite! The good news is: you can protect yourself from foodborne illness by remembering four simple words:</i></p> <ol style="list-style-type: none"> <li>1. <i>Clean</i></li> <li>2. <i>Separate</i></li> <li>3. <i>Cook</i></li> <li>4. <i>Chill</i></li> </ol> <p><i>These words represent the four rules the Partnership for Food Safety Education and U.S. Department of Agriculture urges everyone to follow. As I explain each rule, think about which rule would help you avoid foodborne illness in the situation on your card.</i></p> <ul style="list-style-type: none"> <li>• <i>Cook: Use a thermometer to be sure food is properly cooked. If food is improperly heated and prepared, bacteria can survive in the food. Even experienced cooks can't tell if most food is cooked safely by how it looks. Food is safely cooked when it is hot enough inside to kill the harmful bacteria that cause illness. Cook eggs until the yolk and white are firm. When using a microwave, cover food, stir, and rotate for even cooking. Use microwave safe cookware and plastic wrap.</i></li> </ul>	 <p>To reinforce food safety rules, have students try these activities on the websites listed.</p> <ul style="list-style-type: none"> <li>• Food Safety Word Match</li> <li>• Fight BAC!® Secret Code Puzzle</li> <li>• BAC-Catcher</li> <li>• Hand Washing Experiment</li> </ul> <p><a href="http://www.foodsafety.gov/">www.foodsafety.gov/</a></p> <ul style="list-style-type: none"> <li>• Travel through Safe Food Park</li> </ul> <p><a href="http://www.fsis.usda.gov/food_safety_education/for_kids_&amp;_teens/index.asp">www.fsis.usda.gov/food_safety_education/for_kids_&amp;_teens/index.asp</a></p>

	<ul style="list-style-type: none"> <li>• <b>Clean:</b> Wash your hands, all the items that come in contact with food, and the fruits and vegetables you eat. Frequently cleaning food, hands, and items that contact food prevents bacteria from being spread to food. Keep books, book bags, and shopping bags off the kitchen table and counter.</li> <li>• <b>Separate:</b> Keep raw meat, poultry, seafood, and eggs from touching any other foods. Bacteria spread to ready-to-eat foods if they have contact with raw meats or their juices. Use one cutting board and knife for raw meat, chicken, and fish; use different ones for salads and ready-to-eat food. Never put cooked food on a plate that had held raw meat, poultry, seafood, or eggs.</li> <li>• <b>Chill:</b> Chill leftovers within two hours. Keep cold foods below 40 degrees. Bacteria grow fast in food that is 40 to 140 degrees. Thaw foods in the refrigerator. Use or discard refrigerated food regularly.</li> </ul>	 For a handwashing poster for bathrooms, visit the Partnership for Food Safety Education website.  <div data-bbox="954 363 1485 457"> <a href="http://www.fightbac.org/component/option,com_docman/task,cat_view/gid,39/Itemid,83/">www.fightbac.org/component/option,com_docman/task,cat_view/gid,39/Itemid,83/</a> </div>
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**Application or Skill Practice:** Categorize ways food can be contaminated by bacteria and identify the rules that would prevent contamination. Form crime scene investigation teams to examine situations leading to foodborne illness and identify what could have been done to prevent it.



Approximately 25 minutes

Instructional Steps	Script & Detailed Directions	Extensions & Suggestions
<p>Categorize the cards, "Causes of Foodborne Illness," by the food safety rule that will prevent foodborne illness, using the "Food Safety Rules" posters and the teacher key, "Foodborne Illness Card Categories."</p>  <p>Form small crime scene investigation teams.</p>	<p>Point out the Food Safety Rules posters in each corner of the room.</p> <p><i>Now it's time for you to form your CSI teams and get started on your investigations. <b>Look at the situation on your card and go stand by the food safety rule that would stop bacteria from making people sick.</b> If you aren't sure, you may ask someone else for his or her opinion. Once everyone has decided what rule to use, we will review what we know about the criminal, bacteria.</i></p> <p>Once the students are in four groups, have them sit together comfortably so that they can work together in the next activity.</p> <p>Announce the first rule and ask the students in that group to read their cards, "Causes of Foodborne Illness," aloud.</p> <p>Make corrections as needed. Continue with the remaining three rules until all rules and their corresponding cards have been categorized.</p>	 Use the teacher assessment rubric or have students use the self-assessment rubric provided at the end of the lesson if you want to assess students' skill development.  


<p>Solve four mysteries in which bacteria caused foodborne illness and what could have been done to prevent it.</p> <p>Distribute a situation from the teacher master, "CSI: Foodborne Illness Mysteries," to each group and use the teacher key, "CSI: Foodborne Illness Mysteries," to guide answers.</p> 	<p>In each small group, assign the group roles: leader, recorder, and spokesperson.</p> <p><i>Now you are ready to solve four mysteries involving the culprit: bacteria. In your CSI teams, <b>read the situation you have been assigned and discuss the questions on the handout.</b></i></p> <ul style="list-style-type: none"> <li>• <b>Which of the four food safety rules were broken?</b></li> <li>• <b>What should the person have done to avoid foodborne illness?</b></li> </ul> <p>After five minutes, call on the first group's spokesperson to read their situation. Ask the other three groups to guess which of the four rules were broken. Then have the spokesperson explain what could have been done to prevent foodborne illness. Repeat this process until all four groups have reported.</p>	 <p>If you would like smaller groups, divide the four groups in half to form eight smaller groups. Two groups will work on each situation.</p>
<p>Summarize the investigations.</p>	<p><i>Your CSI teams conducted investigations to find ways to prevent the culprit, bacteria, from making people sick.</i></p> <p><b>What new information did you learn about preventing foodborne illness?</b></p> <p>Call on a few students to share their ideas.</p>	 <p>For another food safety mystery, "Perils at the Picnic," visit the Partnership for Food Safety Education website.</p> <p><a href="http://www.fightbac.org/images/pdfs/Grades4-8FBICase.pdf">www.fightbac.org/images/pdfs/Grades4-8FBICase.pdf</a></p>

**Closure:** Personalize and share ideas for ways to prevent foodborne illness.

Approximately 3 minutes

Instructional Steps	Script & Detailed Directions	Extensions & Suggestions
<p>Ask students to think about one or two things they will do to prevent foodborne illness.</p> <p>Display the poster, "Keep G-E-R-M-S Away."</p>	<p><i>Think about your own food handling habits. <b>What are one or two things you can do to prevent foodborne illness?</b> Turn to your neighbor and share one idea.</i></p> <p>Remind students that handwashing is the most effective way to prevent all kinds of illness, including foodborne illness.</p>	 <p>Invite them to take a handwashing quiz at the Microbe World website.</p> <p><a href="http://www.microbeworld.org/know/quiz.aspx">www.microbeworld.org/know/quiz.aspx</a></p>  <p>Have students keep a journal for two days and identify all the things they do to prevent foodborne illness and one or two ways they could improve their food safety habits.</p>



<p>Distribute copies of the family resource sheet, "Keeping Your Family Safe From Foodborne Illness."</p> 	<p><i>Here is some information to take home to your family about preventing foodborne illness. Talk with your family about what you can do to keep each other safe from bacteria in food.</i></p>	
<p>Preview the next health lesson.</p>	<p><i>In our next health lesson, we will learn about healthy eating and physical activity.</i></p>	





# Helpful Bacteria:

- Make cheese and yogurt,
- Decompose dead animals and plants,
- Clean up oil spills,
- Clean sewage in water treatment plants,
- Make antibiotic medicines, and
- Help us digest our food.





# Harmful Bacteria Cause:

- Cavities,
- Strep throat,
- Pink eye,
- Tuberculosis,
- Pneumonia, and
- Infections of the bladder and kidneys.



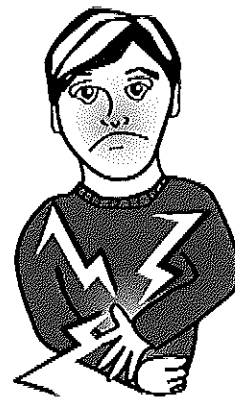
# Harmful Bacteria Cause:

- Cavities,
- Strep throat,
- Pink eye,
- Tuberculosis,
- Pneumonia,
- Infections of the bladder and kidneys, AND
- **FOODBORNE ILLNESS or  
FOOD POISONING**



## **Bacteria and Foodborne Illness Questions and Answers**

In the course of teaching this lesson on foodborne illness, you may be asked the following questions:



### **What can bacteria do to help humans?**

Visit Microbe World to find out the many ways bacteria (and other microbes) help us at [www.microbeworld.org/know/everyday.aspx](http://www.microbeworld.org/know/everyday.aspx).

### **How do bacteria help decompose dead animals and plants?**

When an animal or plant dies, the bacteria that are present everywhere begin to feed on and break down the organism. This process breaks the dead tissue into nitrogen and carbon-based molecules. One byproduct, carbon dioxide, is released into the air; this carbon dioxide is needed for plants to breathe. Bacteria and other organisms that feed on dead or decaying organic matter are called detritivores or saprophytes or saprobes. If bacteria didn't do this job, the earth would be littered with dead animals and plants. In fact, if decomposers did not exist, within a month the earth would be covered in a layer of dead flies almost twenty feet deep! For more information, visit Nature Works at [www.nhptv.org/natureworks/nwep11b.htm](http://www.nhptv.org/natureworks/nwep11b.htm) and Beyond Books at [www.beyondbooks.com/lif72/2b.asp](http://www.beyondbooks.com/lif72/2b.asp).

### **How do bacteria help with oil spills?**

One type of bacteria can eat oil. It is used to get rid of oil that spills in the environment. These bacteria chew up the oil, turning it into carbon dioxide and other harmless by-products.

### **How do bacteria help clean water?**

Once water has been used, it is piped to water treatment plants. *Pseudomonas* cleans waste from sewage water at water treatment plants. This way, "dirty" water is cleaned and can be used again.

### **What situations are most likely to result in food poisoning?**

Food poisoning tends to occur at picnics, cafeterias, and large social functions. These are situations where food may be left un-refrigerated too long or food preparation techniques are not clean.

### **How can foodborne illness result from eating dairy products?**

Food poisoning can result from eating dairy products that have been un-refrigerated for too long. For example, if milk or mayonnaise are at room temperature for hours during a picnic or potluck dinner, any bacteria in the food can multiply quickly and make people sick.

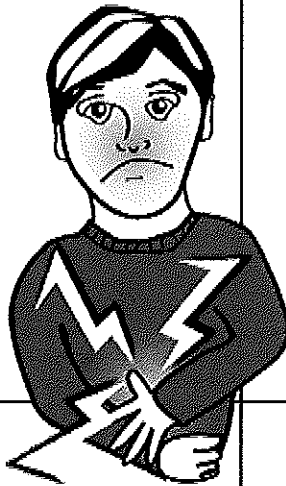
This is especially common with foods that have been prepared by people who didn't properly wash their hands. Foods like egg salad or potato salad that require a lot of cutting and are mixed with mayonnaise are good examples.



## Foodborne Illness Card Categories

### COOK

- Eat hamburger that isn't cooked long enough or is raw.
- Eat pork that isn't cooked long enough or is raw.
- Drink raw milk.
- Eat chicken that hasn't been cooked long enough or is raw.
- Eat eggs that haven't been cooked long enough or are raw.
- Eat raw oysters.
- Drink water from a cool mountain stream.
- Eat fish that hasn't been cooked long enough.



### CLEAN

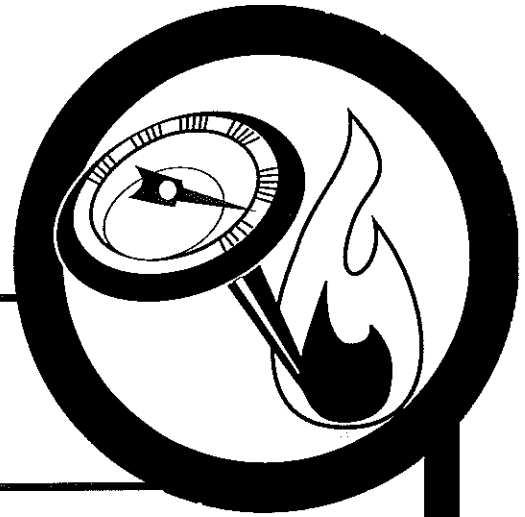
- Eat fruits or vegetables that have small amounts of soil and germs on them.
- Eat fruits or vegetables that have been exposed to water with germs in it.
- Eat salads prepared by infected kitchen workers who did not wash their hands properly.
- Eat milk and dairy products touched by kitchen workers who did not wash their hands properly.
- Eat berries that were not washed.
- Eat food that was prepared by people who didn't wash their hands after petting animals.
- Eat food that was prepared by people who didn't wash their hand after using the bathroom.
- Eat fruit that has not been washed.

### SEPARATE

- Eat food that has been in contact with juices dripping from raw chicken.
- Eat food that has been exposed to insects carrying bacteria.
- Eat raw vegetables that were cut with the same knife used to cut raw meat.
- Eat cooked burgers that were placed on the same platter as raw hamburger.
- Eat fruit that was in your grocery cart under raw, drippy fish.
- Eat lettuce that was on the refrigerator shelf under a drippy package of chicken.
- Eat fruit that was cut on the same cutting board as raw meat.
- Eat grilled chicken that was placed on the same platter as the raw chicken.

### CHILL

- Eat dairy products that have been left out of the refrigerator too long.
- Eat contaminated cooked foods that are high in protein, such as cooked ham, salads, bakery products, dairy products.
- Eat meat that was thawed on the kitchen counter for hours.
- Eat a tuna salad sandwich that has been in your lunch bag more than two hours without a cooler.
- Eat cooked food that has been left out of the refrigerator too long.
- Eat leftover turkey that sat on the counter for a few hours.
- Drink milk that sat in the car while you went shopping for a few hours.
- Eat potato salad that has been sitting on the picnic table for a couple hours and is not in a cooler.



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# COOK

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**USE** a food thermometer. No one can tell if most food is cooked safely by how it looks.

**FOOD** is safely cooked when it is hot enough inside to kill the harmful bacteria that cause illness.

**COOK** eggs until the yolk and white are firm.

**USE** microwave safe cookware and plastic wrap. Cover food, stir, and rotate for even cooking.

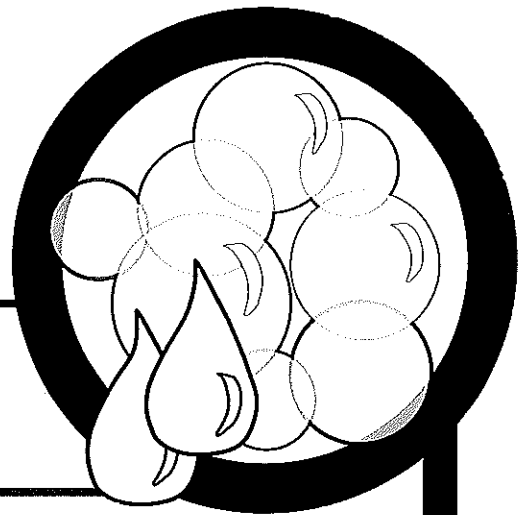
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# CLEAN

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**WASH** your hands with warm water and soap for 20 seconds. Wash them before and after you handle food.

**WASH** cutting boards, dishes, tools, and counter tops with hot, soapy water. Wash them before you prepare each food item and between foods.

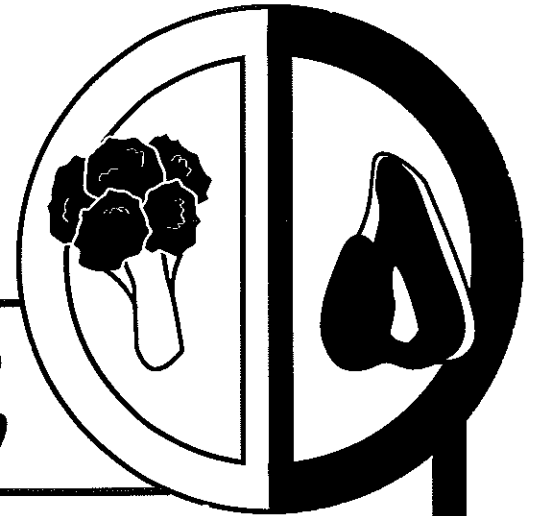
**RINSE** fruits and vegetables under running water. Rinse them even if they have skins and rinds that are not eaten.

**KEEP** books, book bags, and shopping bags off the table and counter.

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# SEPARATE



**KEEP** raw meat, poultry, seafood, and eggs from touching other foods in the grocery cart and refrigerator.

**USE** one cutting board and knife for raw meat, poultry, and seafood. Use a different one for salads and ready-to-eat food.

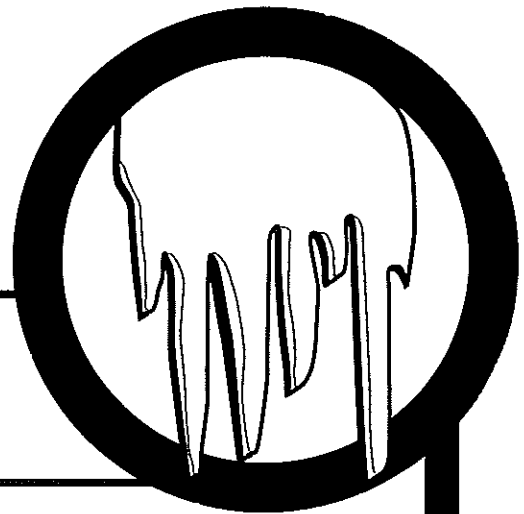
**NEVER** put cooked food on a plate that held raw meat, poultry, seafood, or eggs.

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# CHILL



**CHILL** leftovers within two hours.  
Chill takeout foods within two hours.

**KEEP** the refrigerator at 40 °F or below. Use an appliance thermometer to be sure it is cold enough.

**THAW** meat, poultry, and seafood in the refrigerator, not on the counter. Don't overstuff the refrigerator.

**USE OR DISCARD** refrigerated foods regularly.

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## CSI: Foodborne Illness Mysteries

### CSI: Foodborne Illness Mysteries

#### Mystery 1: Austin's Ache

Austin is in a big hurry to get to school, but still needs to pack a lunch and take out the trash. She quickly collects the trash and sets it by the door. Next, she pushes her cat, Mittens, off the kitchen counter to clear a space to make a sandwich. Tossing the bread on the counter, she spreads some mustard on it and adds a couple slices of bologna. Putting that in a baggie, she grabs an apple from the refrigerator and puts her lunch in her lunch box. Grabbing the trash and her books, she dashes off to school. That night, Austin has a terrible stomachache.

Which of the four rules did Austin break?  
What should she have done to protect herself from foodborne illness?

**Cook:**

**Clean:**

**Separate:**

**Chill:**

### CSI: Foodborne Illness Mysteries

#### Mystery 2: Matt's Mistake

Matt loves to help his dad grill. His dad lets him do more and more of the food preparation. It's Saturday night, and his family always has a burger and movie night. Matt got ready the day before by setting out all the items he would need. He even put the frozen meat on the counter to thaw. Now, he finishes tossing a ball for his dog, Rocky, and goes inside to make the patties. His dad starts the fire in the grill. Matt takes the patties off the cutting board, puts them on a plate, and carries it out to his dad. While the burgers cook, Matt cuts up some tomatoes, lettuce, and pickles on the cutting board. When Dad asks for a plate for the cooked burgers, Matt carries the plate back outside again. Dinner is ready! The next day, Matt and his dad start vomiting and have stomach cramps.

Which of the four rules did Matthew break?  
What should he have done to protect his family from foodborne illness?

**Cook:**

**Clean:**

**Separate:**

**Chill:**



### **CSI: Foodborne Illness Mysteries**

#### **Mystery 3: Sophia's Stomachache**

Sophia and her aunt are doing the grocery shopping. Sophia likes to find the things her aunt reads from their list and put them in the cart so her aunt doesn't have to walk so far. She just got the fish fillets and set them on top of those wonderful strawberries that were on sale. Yuck, she had fish juice all over her hands! She asks her aunt for an ice cream cone on their way home. Mmmm...it sure tastes good on a hot day. Before heading home, Sophia suggests they stop and look at shoes since her feet have outgrown her gym shoes. A couple days later, Sophia has awful stomach cramps and diarrhea.

Which of the four rules did Sophia break?  
What should she have done to protect herself from foodborne illness?

**Cook:**

**Clean:**

**Separate:**

**Chill:**

### **CSI: Foodborne Illness Mysteries**

#### **Mystery 4: Todd's Trouble**

Todd loves to help his mom make cookies. She said they could make chocolate chip cookies that night when she got home. In the morning, Todd set the flour and eggs and all the other items out on the counter. He wanted to be ready when his mom got home from work at five. He even poured his glass of milk so it would be ready. Todd cleaned his rabbit's cage. Then, he cut up some chicken and made a sandwich while he was waiting. Todd used the same knife he used to cut his chicken and measured out the shortening for the cookies. Home at last, his mom said he could go ahead and put the cookie dough together. Now for his favorite part...eating the dough and drinking his milk while the first batch cooked! The next day, Todd starts vomiting and has diarrhea.

Which of the four rules Todd did break?  
What should he have done to protect himself from foodborne illness?

**Cook:**

**Clean:**

**Separate:**

**Chill:**



## CSI: Foodborne Illness Mysteries

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#### Mystery 1: Austin's Ache

Austin is in a big hurry to get to school, but still needs to pack a lunch and take out the trash. She quickly collects the trash and sets it by the door. Next, she pushes her cat, Mittens, off the kitchen counter to clear a space to make a sandwich. Tossing the bread on the counter, she spreads some mustard on it and adds a couple slices of bologna. Putting that in a baggie, she grabs an apple from the refrigerator and puts her lunch in her lunch box. Grabbing the trash and her books, she dashes off to school. That night, Austin has a terrible stomachache.

Which of the four rules did Austin break?  
What should she have done to protect herself from foodborne illness?

**Cook:** *She didn't break this rule.*

**Clean:** *She broke this rule. She should have washed her hands after handling the trash and the cat. She should have washed the kitchen counter before preparing food on it. She should have washed the apple before eating it.*

**Separate:** *She didn't break this rule.*

**Chill:** *She broke this rule. She should have put an ice cooler in her lunchbox to keep her bologna sandwich below 40 degrees until she ate it.*

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#### Mystery 2: Matt's Mistake

Matt loves to help his dad grill. His dad lets him do more and more of the food preparation. It's Saturday night, and his family always has a burger and movie night. Matt got ready the day before by setting out all the items he would need. He even put the frozen meat on the counter to thaw. Now, he finishes tossing a ball for his dog, Rocky, and goes inside to make the patties. His dad starts the fire in the grill. Matt takes the patties off the cutting board, puts them on a plate, and carries it out to his dad. While the burgers cook, Matt cuts up some tomatoes, lettuce, and pickles on the cutting board. When Dad asks for a plate for the cooked burgers, Matt carries the plate back outside again. Dinner is ready! The next day, Matt and his dad start vomiting and have stomach cramps.

Which of the four rules did Matthew break?  
What should he have done to protect his family from foodborne illness?

**Cook:** *Matthew didn't cook the burgers, but it doesn't sound like his dad used a thermometer to make sure the burgers were cooked to 160 degrees.*

**Clean:** *He broke this rule. He should have washed his hands after playing with his dog and before making the hamburger patties. He should have washed them again before cutting up the vegetables. He also should have washed the cutting board after using it to make the patties. He also should have washed the plate before putting the cooked burgers back on it.*

**Separate:** *He broke this rule. He should have used a separate cutting board for the vegetables. He should have used a clean plate for the cooked burgers.*

**Chill:** *He broke this rule. He should have thawed the hamburger in the refrigerator.*



### CSI: Foodborne Illness Mysteries

#### Mystery 3: Sophia's Stomachache

Sophia and her aunt are doing the grocery shopping. Sophia likes to find the things her aunt reads from their list and put them in the cart so her aunt doesn't have to walk so far. She just got the fish fillets and set them on top of those wonderful strawberries that were on sale. Yuck, she had fish juice all over her hands! She asks her aunt for an ice cream cone on their way home. Mmmm...it sure tastes good on a hot day. Before heading home, Sophia suggests they stop and look at shoes since her feet have outgrown her gym shoes. A couple days later, Sophia has awful stomach cramps and diarrhea.

Which of the four rules did Sophia break?  
What should she have done to protect herself from foodborne illness?

**Cook:** *She didn't break this rule.*

**Clean:** *She broke this rule. She should have washed her hands after getting raw fish juices on them and before eating an ice cream cone. She should have washed the strawberries before eating them.*

**Separate:** *She broke this rule. She should have kept the raw fish separate from the other foods in the grocery cart.*

**Chill:** *She broke this rule. She should have kept the raw fish below 40 degrees on the way home.*

### CSI: Foodborne Illness Mysteries

#### Mystery 4: Todd's Trouble

Todd loves to help his mom make cookies. She said they could make chocolate chip cookies that night when she got home. In the morning, Todd set the flour and eggs and all the other items out on the counter. He wanted to be ready when his mom got home from work at five. He even poured his glass of milk so it would be ready. Todd cleaned his rabbit's cage. Then, he cut up some chicken and made a sandwich while he was waiting. Todd used the same knife he used to cut his chicken and measured out the shortening for the cookies. Home at last, his mom said he could go ahead and put the cookie dough together. Now for his favorite part...eating the dough and drinking his milk while the first batch cooked! The next day, Todd starts vomiting and has diarrhea.

Which of the four rules Todd did break?  
What should he have done to protect himself from foodborne illness?

**Cook:** *He broke this rule. He should have cooked the dough before eating it.*

**Clean:** *He broke this rule. He should have washed his hands after cleaning the rabbit cage and before making his sandwich. He should have washed the knife after cutting chicken and before measuring the shortening.*

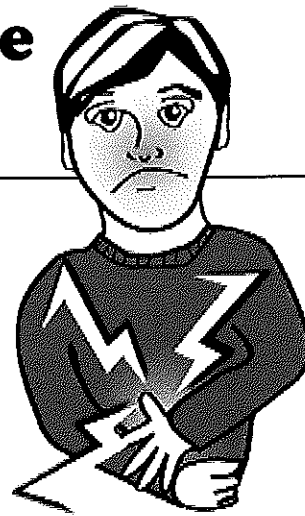
**Separate:** *He broke this rule. He should have used a different knife for cutting chicken and measuring the shortening for cookies.*

**Chill:** *He broke this rule. He should have kept the milk and eggs below 40 degrees until it was time to use them.*

# Keeping Your Family Safe From Foodborne Illness

Germs in food cause 5,000 deaths each year in the U.S. That equals one man, woman, or child dying every 13 minutes. Another 76 million people get sick, but don't die.

Germs in food can make people very ill. This is called foodborne illness. It is also called food poisoning. Stomach aches, cramps, vomiting, runny stools, fever, head and body aches...this is often called the "stomach flu." Experts say these are signs of foodborne illness, not the flu. The "flu" usually attacks the nose, throat, and lungs, not the stomach. If coughing, sneezing, and a runny nose are absent, it is more likely a foodborne illness. Illness can begin one hour to a few days after eating food that has germs in it.



## When to Call the Doctor

For children, go to your doctor or health clinic if your child has these signs:

- runny stools for more than 24 hours
- stools that contain blood or pus
- fever over 101.4 degrees

Children can die quickly if they lose too much body fluid. Contact your doctor or health clinic right away if your child shows these signs of dehydration:

- thirst
- low urine output
- dry skin
- high fever
- lack of energy
- bad mood

For adults, you need to see your doctor or health clinic if you have these signs:

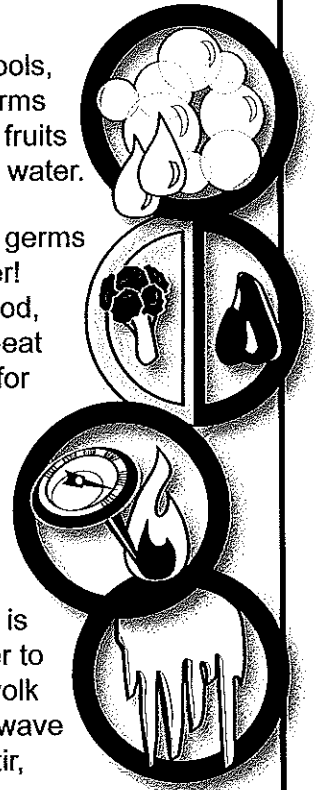
- runny stools for more than a day or two
- stools contain blood or look black and tarry
- severe stomach pain
- fever over 102 degrees
- signs of dehydration

If you think you have been ill due to germs in food, report it. You can help stop an outbreak. To report foodborne illness, go to [www.foodsafety.gov/report/index.html](http://www.foodsafety.gov/report/index.html). You can also phone your public health department.

## What Can Be Done to Prevent Foodborne Illness

Most adults (64 percent) think it is very important to follow the rules for safe food handling. But most do not follow these rules. People can avoid illness by following four simple rules:

- **CLEAN:** Wash hands, tools, and surfaces often to keep germs from spreading to food. Rinse fruits and vegetables under running water.
- **SEPARATE:** Don't let germs move from one food to another! Keep raw meat, poultry, seafood, and eggs away from ready-to-eat foods. Use one cutting board for raw meat, chicken, and fish. Use a different one for salads and ready-to-eat food. Never put cooked foods on a plate that held raw foods.
- **COOK:** Cook food until it is done. Use a food thermometer to be sure. Cook eggs until the yolk and white are firm. Use microwave safe cookware. Cover food, stir, and rotate for even cooking.
- **CHILL:** Refrigerate food promptly—within two hours. Keep cold foods below 40 degrees. Thaw foods in the refrigerator.



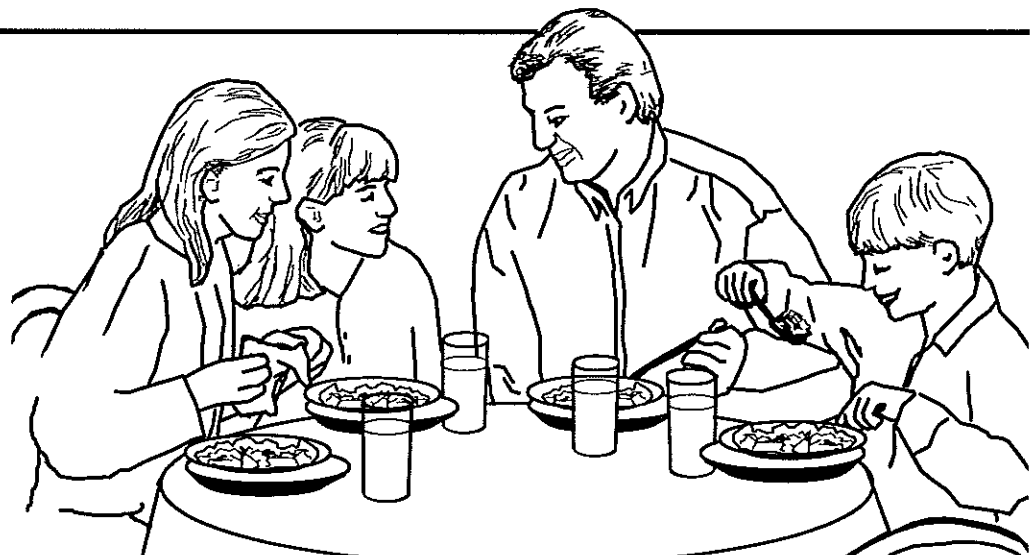
For more details about each rule, visit [www.fightbac.org](http://www.fightbac.org) or [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov).

# Family Resources



To learn more about keeping your family safe from foodborne illness, enjoy these resources:

- "Home Alone? After School Snacks and Food Safety":  
The USDA has a quiz for parents and kids at [www.fsis.usda.gov/news\\_&\\_Events/NR\\_090704\\_01/index.asp](http://www.fsis.usda.gov/news_&_Events/NR_090704_01/index.asp).
- "Can you Serve Up a Safe Barbecue": This fun family quiz is at [www.agr.state.nc.us/cyber/kidswrld/foodsafety/bbq/Bbqhome.htm](http://www.agr.state.nc.us/cyber/kidswrld/foodsafety/bbq/Bbqhome.htm).
- Your younger children might enjoy the online game, "Food Detectives," at [www.fooddetectives.com](http://www.fooddetectives.com).
- The Partnership for Food Safety Education's "Fight BAC!" Campaign has fun family resources at [www.fightbac.org](http://www.fightbac.org).
  - "Healthy Back to School Basics with Quick Lunch Lessons: Important Tips for Safe Lunches and Snacks — <http://www.fightbac.org/component/content/article/2-general/262-healthy-back-to-school-basics-with-quick-lunch-lessons->
  - "Handwashing Poster" — <http://www.fightbac.org/component/content/article/1-downloads/170-handwashing-poster>
  - "Fight BAC" poster for the kitchen— <http://www.fightbac.org/component/content/article/1-downloads/174-fight-bac-poster>
- "Be Food Safe": The USDA provides brochures explaining how to prevent foodborne illness at [www.befoodsafe.org](http://www.befoodsafe.org).
  - Color brochure— [http://www.befoodsafe.org/sites/befoodsafe.org/files/BFS\\_BROCHURE\\_Color.pdf](http://www.befoodsafe.org/sites/befoodsafe.org/files/BFS_BROCHURE_Color.pdf)
  - Black and white brochure— [http://www.befoodsafe.org/sites/befoodsafe.org/files/BFS%20BROCHURE\\_b\\_w.pdf](http://www.befoodsafe.org/sites/befoodsafe.org/files/BFS%20BROCHURE_b_w.pdf)







## Assessment Rubric for Skill Development: CSI Foodborne Illness Mysteries

### Elements in the Lesson

- Identify food safety rules that were broken.
- Identify what could have been done to avoid foodborne illness.

The following rubric can be used for assessing student skill development. The student has demonstrated the following elements of this skill through role play, written assignments, or classroom activities.

1	2	3	4	Comments
Some of the broken rules are not identified. Few of the strategies to prevent foodborne illness are identified and most of the strategies are not helpful in preventing foodborne illness for the broken rule.	All of the broken food safety rules are identified. Some of the broken rules may not: <ul style="list-style-type: none"><li>• have identified strategies to prevent foodborne illness, or</li><li>• have all of the strategies identified.</li></ul> Some of the strategies may not be helpful in preventing foodborne illness for the broken rule.	All of the broken food safety rules are identified. Each of the broken rules has identified strategies to prevent foodborne illness.	All of the broken food safety rules are clearly and completely described. Each of the broken rules has clear and extensively described strategies to prevent foodborne illness.	

**CSI Foodborne Illness Mysteries****Elements in the Lesson**

- Identify food safety rules that were broken.
- Identify what could have been done to avoid foodborne illness.

The following rubric can be used for assessing your skill development in identifying food safety rules and preventing foodborne illness. You may have demonstrated the elements of this skill through role play, written assignments, or classroom activities. Write any ideas or thoughts you have in the "Comments" column.

1	2	3	4	Comments
I did not identify all of the broken rules. I identified a few strategies to prevent foodborne illness and most of the strategies are not helpful in preventing foodborne illness for the broken rule.	I identified all of the broken food safety rules. I did not: <ul style="list-style-type: none"><li>• identify strategies to prevent foodborne illness for each of the broken rules, or</li><li>• identify all of the strategies.</li></ul> Some of the strategies may not be helpful in preventing foodborne illness for the broken rule.	I identified all of the broken food safety rules. For each of the broken rules, I identified strategies to prevent foodborne illness.	I clearly and completely identified all of the broken food safety rules. For each of the broken rules, I clearly and extensively described strategies to prevent foodborne illness.	